

**REMARKS**

**Introduction**

In response to the Office Action dated January 5, 2007, Applicants have amended claims 7, 15, 16, and 24. Care has been taken to avoid the introduction of new matter. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

**Claim Rejections Under 35 U.S.C. § 103**

Claims 2-3, 5, 7-12, 14, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2002-223039 (hereinafter JP '039) in view of the alleged Admitted Prior Art (hereinafter alleged APA). Claim 18 depends on independent claim 16, which was not included in this rejection. Therefore, the rejection of claim 18 should be withdrawn.

The Office Action asserts that JP '039 shows an alleged first metal electrode 11 formed to be in contact with the upper surface of said ridge portion. In JP '039, the alleged first metal electrode 11 is a P-type contact layer consisting of GaAs, which is a semiconductor, not an electrode formed of *metal*. Thus, JP '039 fails to disclose or suggest, at a minimum, "...a first metal electrode formed on the upper surface of said ridge portion" and "the first metal electrode is formed to cover the ridge portion and the support portions, and the current blocking layer is formed on the upper surfaces of the support portions and the first metal electrode is formed on said current blocking layer," as required by amended claim 7.

The Office Action states, "JP '039 lacks said convex ridge portion and said support portions are mounted on a submount through a welding layer."

The Office Action relies on the alleged APA to cure the deficiencies of JP '039.

The rejection relies solely on improper hindsight reasoning to reject claims 2-3, 5, 7-12, 14, and 18 over the cited reference.

As is well known, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the cited reference. *In re Royka*, 180 USPQ 580 (CCPA1974). As JP '039 fails to teach or suggest, "...a first metal electrode formed on the upper surface of said ridge portion" as recited in amended claim 7, then based on the foregoing, JP '039 does not render claim 7, or any claim dependent thereon obvious.

Claims 4 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '039, in view of the alleged APA and further in view of U.S. Patent Publication No. 2002/0146855 (hereinafter Goto).

Claims 4 and 27 depend from claim 7 and includes all of the features of that claim plus additional features which are not disclosed or suggested by the cited references. Therefore, for at least these reasons, it is respectfully submitted that claims 4 and 27 also patentably distinguish over the cited references.

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '039, in view of the alleged APA, and further in view of Hayafuji (U.S. Patent No. 5,387,544).

The Office Action acknowledges that JP '039 fails to disclose, "the dopant, contained in said first metal electrode, having the same conductivity type as said semiconductor layer constituting said ridge portion includes at least one element selected from a group consisting of Zn, Cd, Be, Mg, Ca, and Ba.

In JP '039, the alleged first metal electrode 11 is a P-type contact layer consisting of GaAs, which is a semiconductor, not an electrode formed of *metal*. Thus, JP '039 fails to disclose or suggest, at a minimum, "...first metal electrode."

The Office Action relies on Hayafuji to cure the deficiencies of JP '039.

Hayafuji describes an n-type GaAs substrate 1. Hayafuji discusses using selenium or zinc as n-type and p-type dopants in the GaAs substrate only (col. 1, lines 38-41). The Office Action asserts, "Hayafuji teaches [that] the dopant of zinc in the metal electrode." Hayafuji is completely silent on a first metal electrode or doping the first metal electrode.

Thus, neither JP '039 nor Hayafuji, individually or combined, teach or suggest, "...said dopant, contained in said first metal electrode, having the same conductivity type as said semiconductor layer constituting said ridge portion includes at least one element selected from a group consisting of Zn, Cd, Be, Mg, Ca and Ba" as required by claim 15.

Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '039 in view of U.S. Patent Publication No. 2002/0028390 (Mazed).

In JP '039, the alleged first metal electrode 11 is a P-type contact layer consisting of GaAs, which is a semiconductor, not an electrode formed of *metal*. Thus, JP '039 fails to disclose or suggest, at a minimum, "a first metal electrode."

The Office Action relies on Mazed to cure the deficiencies of JP '039.

Mazed describes an alleged current blocking layer 270, which is an insulating layer of silicon nitride, silicon dioxide, or cyclotene. Therefore, Mazed fails to disclose, "...a current blocking layer comprising a semiconductor" as required by amended claim 15.

Claims 16-18 and 24-26 are rejected under 35 U.S.C. §(a) as being unpatentable over JP '039 in view of Mazed.

In JP '039, the alleged first metal electrode 11 is a P-type contact layer consisting of GaAs, which is a semiconductor, not an electrode formed of *metal*. Thus, JP '039 fails to disclose or suggest, at a minimum, "a first metal electrode" as required by amended claims 16

and 24. JP '039 is *completely silent* on "an emission layer" as required by amended claims 16 and 24.

The Office Action relies on Mazed to cure the deficiencies of JP '039.

Fig. 1A of Mazed shows an enlarged view of laser 10a. A layer of contact metal 30 is formed on the laser's active region 20 in Mazed (Para. [0046]). Thus, Mazed fails to teach or suggest, "...a semiconductor layer formed on said emission layer while constituting a convex ridge portion" as recited by amended claim 16, for example. Additionally, the alleged current blocking layer 270 of Mazed an insulating layer of silicon nitride, silicon dioxide, or cyclotene. Mazed also fails to teach or suggest a current blocking layer including a semiconductor.

Withdrawal of the foregoing rejections is respectfully requested.

### **Conclusion**

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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